

habitat was considered to have good fecal coliform concentrations, 16% was not likely to be suitable for shellfish harvesting and 6% had coliform concentrations considered to be very poor and not likely to be suitable for primary contact recreation or shellfish harvesting (Figure 3.2.2). The locations of sites that had moderately high to very high fecal coliform counts are provided in Appendix 2.

Even though the mean values of fecal coliform concentrations were much higher in both habitat types compared to the 2001-2002 survey, there was not a substantial change in the percentage of the state's habitat that had undesirable bacterial levels (Figure 3.2.6). The higher fecal coliform counts observed in creek habitats is most likely due to the proximity of these small drainage systems to upland runoff from both human and domestic wastes as well as wildlife sources, combined with the lower dilution capacity of creeks compared to larger water bodies. Greater protection of tidal creek habitats is warranted in areas where upland sources of waste can be identified and controlled.

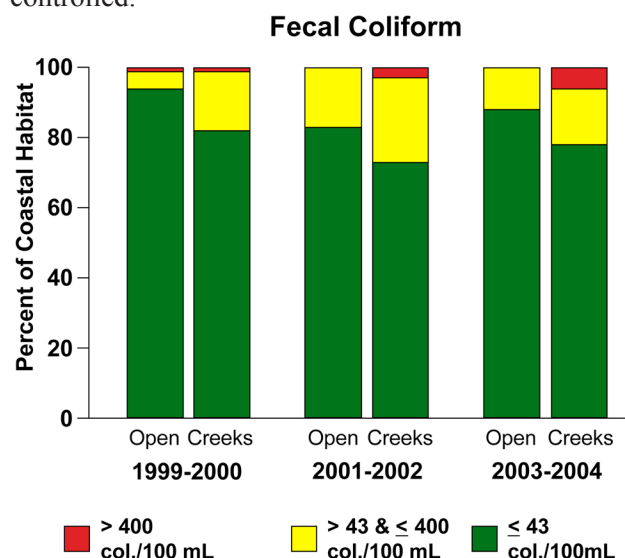


Figure 3.2.6. The percent of the state's coastal habitat representing various fecal coliform concentrations that are considered good (green), fair (yellow) and indicative of possible unsuitability for shellfish harvest, or poor (red) and indicative of possible unsuitability for primary contact recreation and shellfish harvesting during the three survey periods conducted to date.

## Turbidity

Measures of water clarity provide an indication of the amount of suspended particulate matter in the water column. Exceptionally high turbidity levels may be harmful to marine life. South Carolina's estuarine waters are naturally turbid compared to many other states. SCDHEC has recently developed a maximum saltwater state standard for turbidity of 25 NTU. This corresponds to the 90<sup>th</sup> percentile of the SCDHEC saltwater database, which was obtained primarily from the larger estuarine water bodies. The 75<sup>th</sup> percentile of turbidity values obtained from SCECAP sampling was 15 NTU. Therefore for SCECAP, turbidity values ≤ 15 NTU are considered to be good, values > 15 NTU and ≤ 25 NTU are considered to be fair, and values > 25 NTU are considered to be poor because they contravene the SCDHEC standard.

While the SCECAP program recognizes the need to have turbidity standards, the standards are not incorporated into our overall water quality index at this time. Mean turbidities measured in the 2003-2004 survey by this program were 21.9 NTU in tidal creeks and 12.4 NTU in open water habitat (data online), which are very similar to the means noted in previous survey periods (Van Dolah *et al.*, 2002a, 2004a). As observed in the previous surveys, the difference between habitats was statistically significant ( $p < 0.001$ ). Based on the single measure of turbidity taken at each station, approximately 29% of the tidal creek habitat exceeded the State standard, whereas only 7% of the open water habitat exceeded the standard (data online). Turbidity levels in tidal creeks may be naturally higher due to the shallow depths of these systems (i.e. surface samples are often within 1-2 m of the bottom) combined with re-suspension of the bottom sediments due to tidal currents. Because of the high turbidity levels observed in tidal creek habitats over the six years sampled by SCECAP (Box 3.2.1), this program has elected to not include this parameter in the integrated water quality index.

## Integrated Assessment of Water Quality

SCECAP has developed an integrated measure of water quality using multiple parameters combined into a single index value (Van Dolah *et al.*, 2004a). Six parameters are included in the index: dissolved oxygen (DO), pH, total nitrogen (TN), total phosphorus (TP), chlorophyll-*a* concentrations, and fecal